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W. Linwood Chase

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DETERMINATION OF GRADE PLACEMENT OF HISTORY MATERIAL

W. LINWOOD CHASE

School of Education, Boston University

AN article published last year in this Journal¹ showed that the texts in social studies written by Dr. Harold Rugg of Columbia University offered less vocabulary difficulty to students than did the history, geography and civics books that they displaced in one junior high school. The data offered in proof of this were obtained by application of the technique of Vogel and Washburne.²

Vogel and Washburne offer an objective method of gathering data to determine the grade placement of children's reading material, and to the data thus obtained apply a regression equation. In brief, they take a thousand word sampling from the book being examined. In the sample taken they determine the number of different words, the number of prepositions, and the number of words not found in Thorndike's (10,000) Word List. Further, they find the number of simple sentences in a sampling of seventy-five sentences from the text. To this data is applied the following regression equation:

$$X_1 = .085X_2 + .101X_3 + .604X_4 - .411X_5 + 17.43$$

X_1 is the reading score needed to understand the text; X_2 the number of different words in 1,000; X_3 the number of prepositions in the 1,000-word sample; X_4 the number of uncommon words (not in Thorndike) in the 1,000; and X_5 the number of simple sentences in 75.

Any determination of the reading difficulty of a history book based on a 1,000 word sample is certainly open to question. In most history texts for the middle grades and junior high school, such a sample constitutes about one percent of the total words used, more or less. It is quite possible that the difficulty of a text investigated by the Vogel-Washburne technique may vary greatly according to the sample used.

To determine the possibility of variance in grade placement dependent on the sample taken from the text, a history text published late in

¹Cramer, John F. "Relative Difficulty of Junior High School Social Studies Texts," *Journal of Educational Research*, XXVI (February, 1933), pp. 425-428.

²Vogel, Mabel, and Washburne, Carleton. "An Objective Method of Determining Grade Placement of Children's Reading Material," *Elementary School Journal*, XXVIII (January, 1928), pp. 373-381.

1932 and advertised by its publishers for the middle grades, was studied. The preface states how the book has been prepared to come within the comprehension of the children of these grades.

Three samples from this one book were made. To distribute the lines equally throughout the book, the directions given by Vogel and Washburne were followed carefully.

Sample I was the third full line on each page chosen.

Sample II was the fifth full line on the page following each page taken for Sample I.

Sample III was the fifth full line on the same pages used for Sample I.

The same sampling of seventy-five sentences to determine the number of simple sentences was used with the three different 1,000-word samplings.

As stated before X_1 is the reading score necessary for ready understanding of the text examined. This is the score that a pupil should attain on the paragraph meaning section of the Stanford Achievement Test, in order to use the text understandingly and profitably. Table I taken from Vogel and Washburne shows the reading scores translated into reading grades.

TABLE I

GRADE STANDARDS PARAGRAPH MEANING SECTION OF THE STANFORD ACHIEVEMENT TEST
(From Vogel and Washburne)

| Scores | Grade |
|---------|-------|
| 4- 16 | II |
| 18- 34 | III |
| 36- 52 | IV |
| 54- 62 | V |
| 64- 70 | VI |
| 72- 78 | VII |
| 80- 86 | VIII |
| 88- 94 | IX |
| 96-102 | X |
| 104-112 | XI |

The results obtained from the word count are shown in Table II.

TABLE II

DATA FOR THE REGRESSION EQUATIONS

| | Sample I | Sample II | Sample III |
|---|----------|-----------|------------|
| Number of different words in 1,000..... | 464 | 469 | 465 |
| Number of prepositions in 1,000..... | 145 | 164 | 145 |
| Number of uncommon words in 1,000..... | 13 | 24 | 21 |
| Number of simple sentences in 75..... | 27 | 27 | 27 |

Substitution of the data for Sample I in the regression equation gives:

$$X_1 = 464 (.085) + 145 (.101) + 13 (.604) - 27 (.411) + 17.43$$

$$X_1 = 68.27$$

The regression equation for Sample II reads:

$$X_1 = 469 (.085) + 164 (.101) + 24 (.604) - 27 (.411) + 17.43$$

$$X_1 = 77.26$$

For Sample III we have:

$$X_1 = 465 (.085) + 145 (.101) + 21 (.604) - 27 (.411) + 17.43$$

$$X_1 = 73.19$$

Table III gives the reading scores obtained for each sample and the reading grade for each score.

TABLE III
READING SCORES AND READING GRADES FOR THREE SAMPLES FROM ONE BOOK

| | Score | Grade |
|------------|-------|-------|
| Sample I | 68.27 | VIA |
| Sample II | 77.26 | VIIA |
| Sample III | 73.19 | VIB |

Though Sample II followed all the dicta of the Vogel-Washburne technique the same as Sample I, it shows the text to be one reading grade more difficult than Sample I shows. While Sample III is taken just two lines lower on the same pages as Sample I it is one-half reading grade more difficult than Sample I. Variability as much as this is probably to be expected.

It will be noted that the same seventy-five sentence sampling to determine the number of simple sentences has been used with all of the three 1,000-word samplings. It is just as possible to get variance here by choosing another sample as it is in the 1,000-word groups. Another sampling of seventy-five sentences was made, and this time but 20 simple sentences were found instead of 27. Vogel-Washburne's directions tell how to distribute the selection of these sentences but do not say whether one is to begin the sampling on page 1, or 2, or 3.

Suppose that Sample III had been the only sampling made of this text, and suppose that by chance the second sampling of the seventy-five sentences had been made instead of the first. Substituting 20 (.411) in place of 27 (.411) in the regression equation of Sample III, X_1 would have been 76.06 instead of 73.19. This would have made the reading grade VIIA and not VIB. Different combinations will result if 20 (.411) be substituted in the other equations.

CONCLUSIONS

1. By application of the Vogel-Washburne technique to history material for the middle grades, the reading grade found depends on the samples chosen.

2. If two history books vary but one reading grade as determined by the Vogel-Washburne technique, one cannot be said to be more difficult than the other.

3. The difference in difficulty between the Rugg social studies texts and the histories and geographies they displace probably needs to be determined on some other basis than Vogel-Washburne's regression equation.

4. Though this study shows the unreliability of the Vogel-Washburne technique as applied to history material, one must admit that it is some achievement to get even such reliability as it does. It is possible that a regression equation worked out for a larger sampling might bring greater reliability.

5. Above all, there is the question of the validity of any or all of the samples chosen in this study, or any other study, when the computation of a regression equation gives a figure to be compared with the score on a standard reading test. There is no valid evidence that reading test scores correlate very highly with the ability to read social science textbooks. The evidence tends to be in the other direction.

6. If reading difficulty is to be defined as more than recognition of words, and rather, difficulty in getting adequate meanings, it is apparent that the reading difficulty of a history textbook must be determined in some other way—a way predicated on other bases than those of Vogel and Washburne. Little experimental work has been made available in our literature on the variety of elements and combinations of those elements that make sentences difficult for children at various stages of reading maturity.